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AUTHOR Knapp, Linda
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ABSTRACT

Eight Apple Classrooms of Tomorrow (ACOT) teachers met with software developers at the Florida Instructional Computing Conference in January 1989. During the session, the panel of ACOT teachers expressed their wants and wishes for educational software and developers responded with their own concerns. The face-to-face communication provided a successful strategy for discussing future software development for education. Teachers expressed their need for: (1) a network management system for curriculum software that will identify students' needs as well as record their progress; (2) curriculum software that combines practice with meaningful applications of the skills being taught (e.g., adding word processing capabilities to language arts software so that students can use newly-acquired spelling and vocabulary skills to compose sentences or paragraphs); (3) software that complements a literature-based language arts curriculum; (4) software that supports the process approach to writing; (5) curriculum software for the Macintosh; and (6) interdisciplinary software. While teachers noted that many ACOT students do better on standardized tests because they are more highly motivated to learn with computers, several sites reported that test score averages have stayed the same since the introduction of ACOT programs. According to the teachers, students have become more active, independent learners as the result of computer use. Teachers saw their role changing from that of disseminator of information to facilitator of learning. (GL)

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Perspectives

Software Development Through ACOT Teachers' Eyes

ACOT Report # 4
1989

Apple Classrooms of Tomorrow
Advanced Technology Group
Apple Computer, Inc.

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Apple Classrooms of Tomorrow℠ (ACOT℠) is a research project that explores learning when children and teachers have access to interactive technologies. To pursue this research focus, ACOT establishes technology-rich classroom sites and encourages teachers to develop new curriculums and methods of instruction that take advantage of the technology. Within these environments, university-based researchers examine the long-term effects of the technology on teaching and learning. The project also supports R&D projects that apply current learning theories in the development of curriculums, tools, and environments that can be integrated into ACOT and other classrooms.

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Software Development Through ACOT Teachers' Eyes

Eight Apple Classrooms of Tomorrow (ACOT) teachers flew to Florida last January to meet with developers at the 1989 Florida Instructional Computing Conference. Face-to-face communication in this case proved a successful strategy for discussing future software development for education.

ACOT teachers work in K-12 classrooms with high access to a variety of interactive technologies. After a year or two in these environments, the teachers and students turn to their computer tools as readily as chalkboards and textbooks. Thanks to developers, ACOT teachers draw from extensive software libraries which enable them to develop unparalled expertise concerning what works and what's needed in high-tech classrooms.

During the session, a panel of ACOT teachers expressed their wants and wishes for educational software, and developers responded just as candidly with their own concerns. Since the viewpoints they voiced at this session crystalize issues of interest to a broad audience, it seems appropriate to allow the participants speak for themselves....

Curriculum Management Software

Teachers opened the dialog by expressing their need for a network management system for curriculum software that will identify students' needs as well as record their progress. One teacher remarked, "If the software doesn't keep track of what students have done, then I have to go around and write it all down."

"Yes," injected another, "we should also be able to include any of our networked software in the management system, not just programs offered by the company that sells the system."

"You're dreaming," remarked a developer. "No system can do all that." But another proposed a generic management

system with standard interface protocols. Soon, teachers and developers were collaboratively designing the "ideal" management system for a networked classroom.

"How are you using the computers?" queried a developer. "Are you using them as tools? As tutors and practice machines? Are students working individually, cooperatively?"

Teachers answered that they use technology in all of those ways. They said that tools such as word processing are basic in all ACOT classrooms, even in primary grades. The high school site uses almost exclusively tool software on its Macintosh® computers. The elementary sites use a wide range of curriculum and tool software. They explained that all sites do a great deal of project-oriented, cooperative learning for which they rely heavily on computers and other technology tools.

Practice *and* Application Software

Panel members voiced a need for curriculum software that combines practice with meaningful applications of the skills being taught. One teacher suggested adding word processing capabilities to language arts software, so that students can use newly acquired spelling and vocabulary skills to compose sentences or paragraphs.

"But there isn't enough memory or storage capacity on most school computers to do all that," a developer remarked.

"Then you're not taking advantage of the technology that's available," a teacher answered back. "It's true that we have more technology than most of our colleagues, but aren't you developing software with the idea that schools will get more and better computers?"

Developers replied that they would love to, but they had to produce software for the current market in order to stay in business.

Language Arts

Since many elementary schools are now using a literature-based language arts curriculum, one teacher voiced the need for software that complements this approach.

Other panel members asked for software that supports the process approach to writing. "There are programs for brainstorming, for outlining, and for writing," someone offered, "but no package we know of supports every stage of the process."

Macintosh Software

The ACOT high school teachers said they thought it was time to develop curriculum software for the Macintosh. "We need algebra software," said one. "The geometry program from Brøderbund is great, but we need others," he added. "And please, don't tie it to a specific textbook."

"Should these programs be developed on HyperCard® software?" asked a developer.

The teacher nodded yes and proceeded to describe some of the HyperCard projects students at his site are currently doing, such as building stacks that animate geometry theorems, creating illustrated family trees, and documenting history research with diagrams of medieval castles and paraphernalia.

"Do you think teachers will develop curriculums with this technology?" a participant asked.

"Our teachers and students are already doing that," the teacher replied. "But that doesn't mean we don't need you. We need a whole variety of good quality curriculum software for the Macintosh."

Interdisciplinary Software

Both elementary and secondary school teachers wished they had more software that integrates a variety of subject areas. They said that teachers in high-tech classrooms tend to be project-oriented and look for software that supports this approach. "I'd love to see a series of disks that includes science, social studies, computation, reading, and writing activities," suggested an elementary teacher. "The activities could concentrate on the goals of a particular project, such as constructing a timeline, or producing a news broadcast."

"It seems that the technology has affected *how* you teach," one developer commented, "but has software affected *what* you teach?"

"Yes," was the immediate response. "I'm not teaching social studies here, science there anymore. Instead, I'm teaching a variety of subjects by focusing on projects that involve several subjects. For example, the activities in my class are loosely divided into two areas: communications and strategies—"

"But has the *content* changed?" the questioner pressed.

"Yes," another teacher joined in. "Now we teach problem-solving in other areas besides math. We teach keyboarding, database, and spreadsheet skills, which we didn't before, and of course word processing has enabled us to put much more emphasis on the drafting and revising stages of writing." Still another added, "The computers have done so much for individualizing basic skill development that we're now able to spend more time teaching concepts and critical thinking skills."

Further Questions from Developers

"How do you respond to people who ask if the technology improves students' test scores?" asked a participant.

"Unfortunately, the standardized tests don't measure many of the skills we think are important," one teacher replied as others nodded. "We emphasize the application of basic skills, not skills in isolation. We evaluate students' abilities to complete all steps of the writing process, their understanding of math concepts, and the quality of their projects."

Although many students do better on standardized tests because they're more highly motivated to learn with computers, several sites reported that test score averages have stayed the same.

"Are students learning more?" a developer asked.

"Yes," teachers replied in concert. "Besides becoming better writers and problem-solvers, they are generally more active, independent learners. They practice basic skills on their own and quickly move to more interesting activities." Another added, "ACOT students are not afraid to take on new challenges. In fact, other teachers note that even after ACOT

students have left the project, they are remarkably more adventurous learners than the others."

"Have you re-written the curriculum objectives for your sites?" queried a developer.

Teachers responded in different ways to this question, depending on where their schools reside. Most of the sites have some district and/or state-mandated curriculum objectives that they have to address. However, they all have identified new goals for students that they also address, such as acquiring problem-solving and research skills, developing the ability to learn independently, and applying an inquiry approach to learning.

"How has technology affected the quality of teaching?" asked another developer.

"Well, it depends on how you define quality teaching," answered a panel member. "My role has changed from disseminator of information to facilitator of learning and sometimes partner in exploration. I think I'm a better teacher because I've given the kids a more active role in learning. But, you might think I'm worse because now my kids are all over the classroom and it's a good deal noisier." Others chuckled in agreement.

The exchange of ideas and opinions continued through other topics, such as the need for better software security ("Clever students can easily figure out how to beat the system") and more flexible software ("I want to be able to adapt your game software to my curriculum"). And even when the session was over, participants' energy was unmitigated as developers headed for particular teachers to pursue favored topics in greater detail.